

Christian Kameir of Sustany Capital discussing Central Bank Digital Currencies

Hall T Martin: [00:07:41] Hello, this is Hall Martin with Investor Connect. Today, we're here with Christian Kameir, Managing Partner at Sustany Capital. Sustany Capital is a blockchain venture fund headquartered in Newport Beach, California. The firm invests in blockchain-related projects. Christian, thank you for joining us.

Christian Kameir: [00:07:57] Thank you for having me Hall.

Hall T Martin: [00:07:58] Great. So, as investors with a focus on financial technologies, how are you thinking about the history of money?

Christian Kameir: [00:08:06] So, presentations on the topic of money and I'm sure you have seen a lot of those over the years, they will frequently start with a timeline that correlates to the emergence of bartering commodities for grain and salt, and that is typically dated some 11,000 years ago, and another data point there is typically the minting of currencies, which happened around 600 years before Christ. But as far as I'm concerned, the introduction of double-entry bookkeeping is probably the most important point that we should focus on, which was at the end of the 13th century because it has a longer-lasting impact. But then also, if you look at this from a legal perspective, all of these accounts, if you will, of ledger entries, they are stipulating debts which may vary from time to time, so you're updating your accounting entry. This is a technology that initially was kind of correlated with recording these things with pen and paper. However, I mean, even during the time of the _____ which kind of popularized double-entry accounting, literacy was maybe 50% at best. So it's likely that many of the counterparties would have just simply memorized the _____. So, my point here is that this kind of what I call a wetware ledger, the human brain, a wetware, it seems likely that this was actually the case even much longer before humans started to even settle down, right, 10,000 years ago. So, in that sense, if you think about it from a human history perspective, we've been around for some 200,000 years, for the most part, we used wetware as accounting. We would just memorize that we had a debt to another person and that debt could be that I have to fetch firewood or I have to bring you some kill, which is actually pretty extensively explained in David Graeber's book, "Debt: The First 5000 Years" - a lot of people who haven't read it should read it - so rather than putting much emphasis on seashells and these _____ that you typically see in this _____ and presentations or even paper money, I think of the evolution of money, mostly in terms of ledger technology. So, starting with your memory, evolve into carvings and wooden stones to paper. Before then, eventually, most of them became digital.

Hall T Martin: [00:10:39] So, how does your firm structure the due diligence for money technologies? How do you handle that?

Christian Kameir: [00:10:45] Our approach to investment and due diligence is rooted in first principles then the scientific method, right? As such, we spent the last three years developing a lot of detailed theories about the impact of technologies on various sectors of finance, which we usually share for peer review. So, our starting point - if you follow the scientific method - is simply the documentation of the current state of money technology, which I like to divide in four basic stages: the creation of money, the storage, the movement, and then also to some extent the elimination of monetary value. So, within these four stages, then you can observe the friction that legacy systems introduced, so most often this friction will manifest in time delays, _____ and some procedural hurdles such as _____, right? So, some of which can then be understood as the total addressable market, right? And so, doing due diligence, we evaluate the capacity of the technology to reduce this friction and then capture market share in our investment horizon, which is usually 5-10 years. So, we collect all the available key performance indicators, like what most people who have heard of like _____ lifetime value, _____ score, et cetera, and experienced teams will have researched those values and they will have created their own theory on the addressable market and how to capture that. So, in that sense, our due diligence process resembles mostly that of kind of a peer review, because we come with our own thesis that we then either get challenged or that teams will actually, to some extent, adopt. So by now, we collected some several hundred peer reviews on all of those different topics over the last three, four years.

Hall T Martin: [00:12:36] Well, great. So let's talk about central bank digital currencies. What are the stated objectives for CBDCs?

Christian Kameir: [00:12:43] Yeah, so there are quite a few and quite diverse, but I think it best boils down to about five points. So universally, authors will take the position that CBDCs must promote financial inclusion, right? Worldwide, there's 1.7 billion people that are still unbanked, and even in the United States today, 7 million households, so probably 40 million people, according to just the recent FDIC survey are unbanked and then a much larger portion is actually under-banked. The second point that most of these papers will make is to improve cross-border payment, the third is probably the point of programmable money, and the last point is often combined with the ability to facilitate machine-to-machine payments, IoT payments and often micropayments, and something that payment solutions today largely cannot support because of the fees that are involved with even small transactions where a minimum's like \$0.25 and/or a percent. And then most papers for the point of the ability for CBDCs to instantly settle. So, most consumers today already perceive that payments are instant, but from a merchant's perspective, these payments typically don't settle in a matter of even hours, it's typically days and sometimes weeks. And so, the last two points, I think, can be best summarized under the label of competitiveness, because CBDC developments are currently undertaken by about 80% of all nations on the planet in various stages. Some like China are piloting already, and so if you want to be competitive internationally, I think you need to develop a CBDC that provides the programmability and the instant settlement component as a _____.

Hall T Martin: [00:14:43] Great. So, what are the different concepts that are being discussed around the development of CBDCs?

Christian Kameir: [00:14:48] Yes, so the primary differences on the topic of what's called wholesale CBDCs, so they would replace or probably complement reserves at central banks, like commercial banks keep their kind of a restricted access token and this token, you can think of it as a digital bearer_____, so this would then settle immediately. Right now, I think the fastest window is something like four hours, but typically it's much, much slower. And even with larger payments, you probably have heard anecdotes about banks themselves have to send themselves checks amongst each other for million or billion-dollar payments because that's still the fastest way which is_____payments, right? The second concept, though, is that of retail CBDCs, so it's sometimes referred to as general-purpose CBDCs. So, this is the type of currency that then will be available to consumers and would be described as legal tender, obviously, which would combine, for all intents and purposes, the facilities that cash_____systems.

Hall T Martin: [00:16:02] And so, what classifications do you apply to CBDCs and money technologies?

Christian Kameir: [00:16:08] So, as technology, money's utility increases and decreases with network effects, right? The more users accepted in exchange for goods and services, the greater the value of the networks. So, for example, 90% of all money in the United States only exists as ledger interests, and that's true for most money in the world. So moving it usually involves the manipulation of numbers that are stored in databases. So, from a technical perspective, Euros, Yen, and all cryptocurrencies are simply bytes. And so, the unit of account only matters for the visualization, so for the better understanding of the user, and that's part of the technology, it's part of the user interface. So, that's why if you have a cryptocurrency, you usually see that your Bitcoin value, your ether value, your XIP value, or something else is typically translated, why you'll always see the value shown also as the Dollar amount it represents, or in Europe, you see the Euro amount it represents. So in that sense, we can, today, state that the default medium of exchange for 97% of all transactions has been bytes for quite some time, while the primary function of money is simply that of a unit of account or simply that of the language of value of the user. So, as technology investors, we'll take a very, very nuanced view on the topic of money as a technology specifically. So, if you observe that a lot of people in the banking industry in presentations they typically tend to use this old textbook definition of Jevons'from I think, 1875, which says that money is a unit of account, a store value, and a medium of exchange, and that really doesn't hold true for the technology that we're using today, right? It's mostly about if and how good bytes that you're storing are moving and are representing of the Euro's interests, so speaking in broad money terms, that's primary right now as of today. Let me see.... Can I share that slide with you? I think that's kind of an interesting slide. If you just look at broad money terms. Do you see my screen by the way?

Hall T Martin: [00:18:29] Yes.

Christian Kameir: [00:18:29] You do. OK, then I probably should have used that before. My apology. So, all _____ So what did I want? Oh yeah. So, this, if you look at broad money, right, so cash - and actually, yeah, that's an up-to-date number - so cash is "only" \$1.8 trillion right now but there's almost \$4 trillion at the moment in checking accounts, you've got a lot of corporate debt, you got mortgages. The largest group right now is certificates of deposit and money market accounts, CDs are the larger parts and then we got other groups to factor into broad money_____ So, the larger point here being is that, so these bytes are all storing value are the questions for who and how, right? So, while users think of their CDs as savings accounts, they're indeed lending out their money and currently mostly at rates that are below inflation. So the few exceptions, money stored in a _____systems is either borrowed by the account holder or lent to the account holder. And in the case of checking accounts, at no interest, right, that you're getting? So, our classification focuses on the main use cases of money, which is simply spending and lending, right?

Hall T Martin: [00:20:04] So, what business sectors will be most influenced by CBDCs?

Christian Kameir: [00:20:09] So considering that these use cases of money today can be simply put into spending lending categories and the former use cases as you can see is much, much smaller than the lending part. So, there's about \$2 trillion a year that are being generated from payments worldwide, whereas mortgages in the U.S. alone are currently \$10 trillion U.S. So, in the United States and most other countries as we pointed out, money only exists as _____ interest and they're either liabilities of the company maintaining the ledger, usually a bank or the client of that institution. So, CBDCs in principle, enable the user to perform _____ CDs. So, rather than leaving their funds in checking and savings accounts and they could sort of make these available to peer to peer, or managed lending markets and we see that very nacently already. I think, I don't know if I put it here, I don't think I did. OK. I did not. So, we can already see this very nacently in what's called the DeFi market, the decentralized finance market, which is predominantly marked by lending cases and right now, there's only \$12 billion locked in those, which obviously is very, very tiny compared to the traditional lending markets. However, that's largely due to the fact that the onboarding of fiat currencies into the space is either cumbersome and/or mostly expensive, right? If you're already a percentage down, if you onboard your fiat into those systems, and right now, that's not something that you can use so there's no CBDCs, you have to buy crypto, then you're already down as a starting point. So, that's the largest friction that CBDCs could remove.

Hall T Martin: [00:22:05] So, in what ways are existing fintech companies impacted by CBDCs?

Christian Kameir: [00:22:12] So, if you think about this, as many fintech companies have integrated their solutions to the legacy financial service compliance, so they typically create some _____ interface, which on the surface provides a better user experience, right? But the underlying technology is forever and some cases date back to the 1960s. You've probably heard of this very recently came out during the whole COVID situation that there's a lot of database sets still use COBOL and they're largely used by either the government and/or financial service providers. So, this technology that has been incurred by the legacy fintech systems - like I would

want to call them - those extend then to the fintech companies themselves. So, fintech companies themselves make it exclusive for extensive use of database solutions to store mostly _____ transaction data, but it's a little bit unclear what specific technology CBDCs will ultimately leverage, but it seems to indicate very strongly that central banks which are already piloting blockchain-based solutions and more CBDC discussion papers suggest that blockchains are the likely design choice will tend towards that. So fintech companies of the past, they will have to heavily invest into new infrastructure to compete with startups in the space, which themselves can start developing new systems from a blank slate, and a lot of these building blocks here are actually open-source solutions, so there is no additional cost typically for startups that want to start leveraging these solutions, which we see specifically in the DeFi space where there are new solutions now emerging, at least on a weekly basis, sometimes every other day.

Hall T Martin: [00:24:06] So, how can commercial banks prepare for CBDCs?

Christian Kameir: [00:24:08] So, based on the current _____ that we've studied, a design choice for most CBDCs will be that of a transferable digital bearer instrument. So, this peer-to-peer requirement suggest very strongly that they're going to be similar to cryptocurrencies such as Bitcoin, right? And even Brian Brooks over at the Office of the Comptroller of the Currency issued a statement not so long ago in July this year stating that very shallow banks already have the authority to _____ cryptocurrency, which suggests to me that commercial banks should embrace that option and start hiring personnel which then can assist with building the technical requirements for those and then consequently _____ CBDCs. The problem a little bit that we've seen is that almost all of the legacy technology providers that _____ the banking space, they're offering something that is blockchain-branded, however, from our perspective doing due diligence on cutting-edge technologies, most of them don't really meet the criteria for what we deem to be necessary to be competitive or even viable over the next 5, 10 years. As such, I think the first step for most commercial banks would be to seek some independent advice to understand the technology in the space. And as you know, we can't do this on a bi-weekly basis because, well, we're doing this anyway, so we kind of like to share the support for education.

Hall T Martin: [00:25:51] So what impact will CBDCs have on the average consumer?

Christian Kameir: [00:25:56] Well, you can think about this in two main groups, right? One of them is kind of the global constituency and then you've got the national perspective. So statistically, central bank currencies only lasted about 27 years before their fiat usually due to hyperinflation, right? And given what I would consider _____ design choices, a CBDC would make it easier for citizens to combat this type of inflation. And, if you look at the past quite often, the average _____ when their own currency started to weaken, have turned to what I would call the secondary language of value for their everyday human needs, right? In the past, that has mostly been the printed version of the U.S. Dollar, so about \$900 billion worth of U.S. Federal Reserve notes, so, that's more than half is currently how it's outside of the U.S. so they're kind of interest-free loans, if you will, from a legal perspective and the fact that they're

really never coming back. So, there are some good articles that I would suggest that claim that the U.S. Dollar is actually the most profitable export product of the United States, but, there's good arguments to be had for that. So, an efficient CBDC design but then would enable the average consumer around the world to move on into cash for payments needs purposes, so this has largely impact on every national basis, which you could then leave funds otherwise in something that is actually interest-bearing. This seems to be the expectation by some of the authors of these CBDC design papers because they actually suggest themselves already that CBDCs might already be interest-bearing in _____.

Hall T Martin: [00:27:55] Ok, and CBDCs help to solve the problem of unbanked consumers?

Christian Kameir: [00:28:01] When we talk about unbanked consumers, you can think of those in about three classes. So, there's individuals who simply cannot open a bank account because they don't have some government credentials, they are undocumented either in this country or that's actually more predominant now by countries. Then the second reason would be simply the unwillingness of banks to open bank accounts due to lack of credit history, otherwise, these people are deemed unworthy. And then lastly, and that's actually a significantly large group, some consumers simply don't trust banks. They're old enough to have seen bank runs and bank failures and that has been true in the United States every year, with the exception of one year where there was no bank failure, and so, people who had a bad experience simply don't trust them. So, if CBDC designs a model after cash, they wouldn't require government credentials. And obviously, if you could hold it yourself, you could custody the digital dollar yourselves. For example, you didn't have to trust the bank, so that would persuade people who lost faith in the banking system and then all of those people could then actually receive payments directly into digital wallets.

Hall T Martin: [00:29:23] So, who stands to benefit most from CBDCs?

Christian Kameir: [00:29:28] So, the primary focus, as far as I can tell by reading a lot of these discussion design papers, has been that of payment functions of CBDCs, which I actually don't agree much with since as we've seen earlier, the primary use case for fiat money is that of lending. So I think there should be more consideration given to the lending function of that, but it may be as such a point of sales provider and digital wallet startups that are prepared for the introduction of CBDCs will probably be able to take a lot of market shares from their competition albeit, I think that the important part here to consider is that if you take cash in this kind of the "gold" standard, if you will, for payments, well, gold tends not to bother me more than to say I'll give it to you, I don't have it anymore, you have it, it settles the transaction with finality and no one had to look at your passport and so forth. So, these are all qualities that make cash-as-a-payment method, really, really attractive, and that's why you see certain merchants actually putting out signs like, "Sorry, we don't accept credit cards. We only accept cash." And that, by the way, is a choice of every merchant, at least in the U.S. I don't know much of how it is for most other countries, albeit I expect that's true for other countries as well. So there's somewhat of a misconception, actually, that I have to correct quite frequently when we talk about these topics, is the misconception that legal tender laws require the merchant to

actually take fiat currency as payment, that's actually not true. So, legal tender law only set forth that it's for payments to the government and for debts, right? And so, it's actually the choice of every merchant to decide, "Hey, I only want to be paid in Bitcoin, I only want to be paid in cash, I only want to be paid in Pokemons" for that matter. So, the larger point here being is once you realize that as a provider of point of sale systems or digital wallets, you can introduce much more interesting payment solutions and from that perspective, coming back to the original cash payment that doesn't carry any fees, so it doesn't carry any friction in terms of needing to do KYC and so forth, my expectation would be that payments of which the entire industry today is \$2 trillion globally, will actually move to zero out of us, so, to zero profit. So what that means is that this could be leveraged by startups in the space that provide the payment function, using CBDCs for free by introducing additional services _____system or any additional analytics, and then provide something of _____rather than what you see now. Almost all payment systems that merchants have are metered, right? So, they will have a one-time fee for a transaction and/or percentage of the transaction amount, and this holds true even for the largest merchants. I think the largest number I saw for the largest investment the plan to purchase Wal-Mart, is they still have to pay a 1% credit card fee, which, that is a lot of money for a company that makes billions of dollars every week. So, that is a lot to pay in transaction fees, which in that case, Wal-Mart specifically already had contemplated to introduce their own currency, which in my opinion, a lot of companies should intermittently do before CBDCs come around, that's much more attractive. Stable coins could be issued by all of these merchants almost instantly, at least for internal use and/or payment specifiers_____recommendation. So, larger point, who stands to benefit most from CBDCs, I think it's initially because of the strong focus on payments and the requirement of that to be legal tender, so interchangeable for account money and central bank money. I think merchants specifically and payment providers will benefit the most. Long term though, I think, as I mentioned earlier, it's anybody who provides some form of lending facility.

Hall T Martin: [00:34:10] Ok. So, how would you describe the state of money in CBDCs today?

Christian Kameir: [00:34:16] So it's very fragmented and the communication is also very different. So you probably saw that China supposedly is very far ahead in their deployment of CBDC. They recently put out this marketing message of giving away free money to merchants in Shenzhen and to consumers in Shenzhen that could just spend that particular CBDC. But they actually have to spend within a given time which is also interesting. So, they are supposedly piloting this, but I'm somewhat skeptical of this particular development, specifically because what I would presume the intent is somewhat different than most other CBDCs, right? I'm not going to comment on the political intentions of the party that's supporting this particular development, but I don't put this necessarily in the same bucket. I wouldn't expect that outside of China there is going to be much interest in adopting this specifically. So, then when you look at CBDC developments in Europe, which I'm fairly familiar with, they are much further ahead in their discussions than here and then Canada specifically, I think it was either - I want to say it was Canada - who started the first research in that space, they're very far ahead and then they kind of put on the brakes. One of the reasons and one of the hesitations that actually why I think the Australian development team has been mentioned is their concern of what it would

do to commercial bank systems, and that's rather obvious if you think about it this way, that anything that's not physical cash is basically sitting in a bank account right now. So, it's sitting under the control of some commercial bank, who for the most part, will be able to monetize that, even though most people would have thought this pesky fractional reserve, that actually has actually never been true, but even if you ignore that, there's a lot of money to be had and to be made simply by being custodian of funds that are sitting under your control. So, this control could potentially be given back to the rightful owner, to the account holder, who can then either make that interest himself and/or give it to others to leverage it in this way. So, the critical point here is, in my opinion, if and how the conversion between those different funds, they just _____ what I mean by that is so right now, most of the money it's sitting in things like certificates of deposit, or time-locked and money market accounts, and right now you are probably aware that the rates for CDs are well below inflation, and so that's really not a good place to park your money. It's not really storing value for you as much as actually using it_____. So, from that perspective, CBDCs could mitigate a lot against this inflation, but that's also obviously where we have strong pushback by the incumbents that will see a lot of their holdings being diminished. So, long story short here, the speed of these discussions is sometimes actually actively paused where developments just said, "Oh, right now it's unclear what this will do to commercial banking and I think it might be very negative to commercial banking", at the same point in time what everybody that is concerned with these topics has realised, it is a competitive necessity means if and when one country that is relevant in global trade will introduce its own CBDCs with the facility to do an instant settlement, with the facility to create programmable money, this would be an enormous competitive advantage. And so, if you look at this from a global perspective and I don't know how to share my screen here, I think I have one where we have kind of the distribution of.... Oh, so world reserves, so this is kind of the world's reserve status today. The U.S. Dollar by far is the world's reserve currency, the Euro being a second distant. That is our strongest export mechanism, our strongest argument. And then from a network perspective, the fact that you can pay in U.S. Dollars in a lot of other countries where they readily accept it, is a very important network effect that the U.S. Dollar must maintain. So, I think that other countries are realizing that and are more interested in introducing a CBDC exactly because of that, because it could actually take away to some degree the majority of international trade financing, right?

Hall T Martin: [00:39:58] So, how do you evaluate the competitive landscape of money, technologies, and CBDCs?

Christian Kameir: [00:40:04] So, over the past, I want to say was it, I want to say it's already been five years at this point in time, so we have obviously seen things like "stable coins" emerge. And, I used to call this intellectual time travel and that's specifically because usually when you read the white papers, and I think maybe by now they kind of realize this themselves, they introduced stable coins as kind of fixing the error that Bitcoin introduced and by error they were typically referring to the fact that Bitcoin is very volatile and they were trying to mitigate against the volatility. But then if you simply analyze what happened with the usage of this instrument of stable coins, so let's use the largest one by market _____ which is _____, and was the earliest one. So, we realized that the actual use case is simply that of trading, and

it's typically trading on custodial centralised exchanges and typically as an exchange mechanism of Bitcoin. So, the point here being is, it had nothing to do with using it for payment, right, which was the main argument that was made by these white papers initially and simply in my opinion, that's ignoring us, that the main friction point is not the volatility, the main friction point is the fact that I as a user don't understand the value. It's simply my language value is something else. I want to understand it in terms of Dollar, I want to understand it in terms of Euros, and from a technology perspective and from a technology investor's perspective, the worst thing you can do is introduce a new technology and introduce a new language. This is probably the largest friction you could introduce and the biggest point to prevent adoption. And we still see this today and we've seen dozens of stable coin projects and they all have the same problem. Another problem, and that's partially being mitigated against this, even if you use a "stable coin", A, none of those are actually stable, so none of them ever held the _____ one to one for any length of time, even though for most of them, the differences weren't all that great. It was might be a penny _____ cases for a day was something larger than that. But even if it's just _____, it's still not stable and it's still introducing this mental friction, which again, that is the larger point that prevents those instruments from adoption but then the obvious one in terms of payments, there's still no payment system that is willing to adopt it. And then the largest one, I think that's often forgotten and that I think that's kind of been pushed by the sides with PayPal's recent announcement is, for the most part, the exchange of even a stable coin - or any other cryptocurrency for that matter - is a taxable event. So, imagine this, you're paying for your coffee in Bitcoin or a stable coin, and it becomes a taxable event and at the time you're filing taxes, you all of a sudden realize, oh, now I somehow have to create a line item on my tax return that speaks to the Starbucks coffee I bought on April 13, so for the last 50, now I have to establish the base of how I bought this particular coin I spent this particular day. Unfortunately, again, this is mostly not mentioned and I think it's going to be a rude awakening for a lot of people come tax times like how to mitigate this, because all of a sudden you end up spending now off your life or an hour on your tax accountant to figure out what these 500 micro-purchases that you did that used stable coins or cryptocurrencies in general, meant for your tax return. So, that is not good. So anyway, so needless to say, CBDC's would sidestep that and at this point in time, probably make most of these stable coins useless and superfluous, right?

Hall T Martin: [00:44:43] So, how would you describe the influence of blockchains on money and CBDCs?

Christian Kameir: [00:44:47] So, largely blockchains are still very much _____. For the past couple of months now I've been trying to simplify it because I've been explaining blockchains to people in our local meet-ups for five years on a monthly basis, and it's still too complicated and partially it's because as you know, I like to say, reality doesn't have an advertising budget, so a lot of people that use that term use it as a marketing term for a solution that really has nothing to do with blockchains. So, in the most simple terms, what I like to say is blockchain replaces databases. A lot of times people will explain blockchain as a type of database, I think that is god-awfully wrong. And, here's how I like to describe this in like, let's call it technology history. Remember we were talking about the early ledgers being wet, were being a brain memorizing

your debt, right? This was then followed by, let's call it sticks that were carved into as a new ledger and then eventually we invented paper and pen, we started recording debts in this form, and by the way, this was always the largest form of money, right, at any given point in time. Paper money, you saw the money that Jevons described and which was commodity money, wasn't very relevant indeed to the commons. So, but back to how you fit in blockchain. So, if you come from wetware to sticks, to paper money, then eventually what we introduced in 1960 with COBOL was databases. And so, then critically, banks and financial institutions and anybody else dealing with accounting entries started to use databases. But then what happened is we came about networked technologies and initially those were private networks, and then eventually the Internet came about, and so we connected, and by "we" I mean financial people, service providers, and others connected these databases to networks, and this has been overall very convenient, but it overall has also been a security disaster. And so, any data basically you can make this bank statement that sits in a database at some time was compromised. There's a lot of instances that we've heard about and then there's probably many more instances that we haven't heard about, right? Where everybody at some point in time, probably in the United States has heard of and are impacted by the _____ effects hack, and most people have heard that AT&T got hacked, Yahoo got hacked, so the larger point here being is databases are insecure, will be insecure, were insecure, and are not the right instrument if and when which we have now, we have better technology. So, blockchains in that sense actually replace databases, and they're the primary way of - that I like to think about this is in cryptographic perimeters, and that sounds like a big word, but think about it in simple metaphors. If you have paper money right, you have it under your control, you can put it under your mattress, if they are wanting to steal it from you, I have to break into your house, and if you're there, I have to hold you at gunpoint and take that paper money away from you, if I knew somehow in the first place that you kept a lot of paper money around, right? So, that's a fairly good security mechanism if you compare it to bank accounts, which at any given point in time, databases are being hacked, and either it's for funds and/or for personally identifiable data that's then being used to somehow get access to other funds. So, if you forward this also then to personally identifiable data, which is actually the more critical part, think about it in terms of your passport. So, the metaphor that I like to use is you take your passport out of your drawer at home, you go to a border, you hand it over to the passport agent and he hands it back to you. So, if I wanted to steal your identity by stealing your passport, I have to find you, I have to find your house, I have to find the passport in your house, and then I have to steal it, and then I have to somehow use it in some particular fashion. So, to summarize this very simply, this is how you should think about blockchain-based solutions. Think about these in terms of digital bearer instruments, but not only digital bearer instruments that pertain to assets such as simple ones that are just "money", but also think about digital bearer instruments that are things that are PID, personally identifiable data. So, in summary, all database systems, my expectation over the next decades, will be replaced by decentralized software and I use that term decentralized software because it describes both blockchains as well as DAGS, which is a different instrument, distributed acyclic graphs, which is probably the more likely technology to store PIDs, personally identifiable data. So, now, I think I forgot your original question, was it competitive landscape?

Hall T Martin: [00:50:19] We were.

Christian Kameir: [00:50:20] You asked about the influence of blockchains on money. So, the influence of blockchain on money is, in my opinion, threefold, and that's, I think, the biggest kind of structural misconception or structural missing points from a lot of these papers as a technology. We look at this very much in three different stacks or three different buckets, if you will. So, the one part of the CBDC is the currency, is the coin, is the token, which is an instrument on and of itself. So, that instrument on and of itself isn't very useful if and until you, the user, have client software that operates with that, right? So, let's call it your digital wallet. So, the digital wallet, is its own stack and in my personal opinion should be developed by many, many private entities around the world and CBDC designs should limit themselves to provide APIs that let those wallets interact with that. But then another stack that needs to be still completed, which a lot of people are working on right now, is the whole identity stack, because if you still ask the digital wallet holder, have to then do KYC because the CBDC is being distributed by commercial bank let's say and they have, know your customer requirements, then you cannot fulfill the original mandate of those CBDCs, which is to onboard a lot of people that are unbanked today because a lot of these people that are unbanked today, they are unbanked because they don't have government-issued credentials. So, I think it's very important to think about the design in these three different stacks, and as investors, we focus on all of those three different stacks, and we have been focusing on the identity part and the wallet part much longer than we are focused on kind of the coinage part, because that part isn't all that interesting as far as I'm concerned, because that comes down to the ledger. Think about it in terms of once you have a digital wallet, and ideally your digital wallet should be able to hold a whole bunch of "digital assets" - it's really somewhat of a conflated term - but the point there being is you should be able at someday in the future to hold government-issued fiat currencies, as well as things like the title to your car, as well as things like government-issued credentials. So, they should be all managed by one particular instrument that is under your complete control and it looks like they're coming up on the _____.

Hall T Martin: [00:53:16] Cool. So, is Bitcoin a competitor to CBDCs?

Christian Kameir: [00:53:20] The short answer is no. And so, still today, a lot of people talk about Bitcoins in terms of money, but as I explained earlier, the real remaining function of money, generally speaking, is simply that of a unit of account or simply that of language, and I've been doing this presentation on the state of blockchains for a long time and it always has one slide in there that shows a banana with a Bitcoin price on it. So, I don't think that many people expect to see a Bitcoin price on a banana, right, anytime soon, if ever. So, I like to think of Bitcoin as money of last resort, as in, if all fiat currency fails, Bitcoin will become _____; that would be the only reason. And so, in that terms, it would have to replace what's currently money of last resort, which is U.S. Dollars, right? In the past when - I think I mentioned that before - when a local currency failed, people would usually turn to the U.S. Dollar in printed form and try to get a _____ on that for the use of payment.

Hall T Martin: [00:54:41] Well, so which new uses will the new money technologies and CBDCs create and support?

Christian Kameir: [00:54:47] Yeah, so I mean, the obvious ones that we talked about, which is let's call it the decentralized lending space, with lending being the largest use case for money today and then new-use cases such as micropayment specifically, we like to use the term "streaming money", we actually started a book project on the term some time ago and we'll take a few more months to complete that. But, think about things such as self-driving cars where at any given point in time you want to pay people for the usage or get compensated for the usage of that self-driving cars mile by mile and metered in _____ where you can make micropayments that are less than a penny, you could facilitate that. And already, and that's kind of one of my favorite use cases is, right now, most payroll systems will either happen bi-weekly or even monthly and this just facilitates an entire industry that, in my opinion, shouldn't exist, which is the whole payday loan industry. So, programmable CBDCs will make it much, much easier for employees to be paid daily, or even hourly, or if need be for much smaller increments of that _____ but without fees that are currently incurred for payment systems at large. And then, the last one is anything that has to do with "Iot", the Internet of things, where actually devices need to be able to hold their own funds to do certain transactions. We already see some nascent markets for that, but where software can pay software for usage if I just need to use another software for a very short period of time rather than involving the user or creator of the software, you can assign a wallet to that particular software and say, OK, if you need additional computing resources, why don't you commission it to yourself? Here are some funds, and the other party will usually accept legal tender rather than what's happening now is, I always have to figure out what the other software, what cryptocurrency it might accept and then I'd have to buy that cryptocurrency and sometimes at great expense just for that particular transaction. So, that's the current state right now. So, CBDCs would swiftly remove all of that. Again, given the right design choices, that is still very questionable, right? There's a lot of work to be done. Many people that I talk to in that space expect significant progress inside of five years. I think what we will see is that one country will make significant strides, which will then force the other countries to catch up, and/or we also facilitate some more localized development as well to talk to the state of California, specifically of them creating the specific payment option that is very, very relatable and would facilitate things like government payments. Think about, like, food stamps, etc., are two that are basically money to be issued on the blockchain-based solutions. So the step from that to then something that is a more general payment function, more general money, is much, much lower and much more _____ at this particular day, at this particular time.

Hall T Martin: [00:58:31] Great. So, what lessons do you draw from having analyzed the cryptocurrencies in general and stable coins in particular?

Christian Kameir: [00:58:38] Yeah, so I think the most important thing to realize is that you have got very different use cases, and you want to develop specific to that use case. You want to develop your CBDC and/or your stable coin for that particular use case and then realize that, yes, it's only going to be used for this use case and nothing else and if and when a CBDC comes,

I want to replace that stable coin with a CBDC. So, I mentioned that earlier use case of trading of cryptocurrencies on centralized exchanges mostly, the other part was stable coins are being used by _____ in the decentralized finance space and they are specifically decentralized lending. But I think that's the important part to realize that the functions of money are not the ones that you might have learned in business school. It's typically not a relevant store of value and it's definitely not the medium of exchange, because if you think about this, the medium of exchange for Bitcoin is the same typically as the U.S. Dollar is to _____ buy it, and that is, I think is largely ignored. And also if you think about the fact that I always have to _____ or label any of my stable coins or cryptocurrency, still with a U.S. Dollar label, then you also should realize that's just friction. So, just make the assumption that people won't learn a new language and make the assumption that the default medium of exchange for anything at this point in time is just bytes and build your technology accordingly, use-case specific. So, don't try to introduce a new language and don't try to sell people on something that is not a new medium of exchange by just simply using existing _____ or just the Internet protocol for most cases.

Hall T Martin: [01:00:36] So, what are single points of failure in the design of money technologies in general and CBDCs in particular?

Christian Kameir: [01:00:43] So, I touched on that earlier. I think several points of failure is whenever you create something that's not compatible with either the existing payment systems and/or new and upcoming technologies, right? And we have an infrastructure for payments that people are using, so payments actually, in my opinion, is not the larger problem to be solved. You and I have many ways to pay to _____. You can use a debit card, you can use ACH, you can use a credit card, you can do wire transfers, you can use PayPal, and there seems to be an unlimited number of choices already for payments, right? I think the focus here should be given more to where's the actual friction today? Where are the inefficiencies and where should be facilitating payments at the fastest pace? So that's on the merchant side, right? Why do merchants have to wait oftentimes up to 90 days for funds to settle? Because the settlement risk is priced into every payment that you're doing today, so even as a consumer, you're obviously paying for it, right? If the merchant has to pay credit card fees, debit card fees, ACH fees, he has to price this into the goods and services that we are acquiring from them. And so, this kind of extractive mechanism I like to explain with a real simple metaphor. You and I are using right now, voice over IP protocol, and it's entirely free, and it's been around for some time and it works really well, and if we couldn't use that we would probably be paying a metered rate to some telecommunications company, right? And the other more obvious example to most, I think, is that of email. I mean before the emergence of something like SMTP - the simple message transfer protocol - or POP for email, we were using mail, right? We were using physical mail, a printed letter and then we put a stamp on that and carried it to the post office. So, at some point in time we did these thought and actual mathematical experiments to figure out, OK, if we had to put a stamp on every email, how much would this cost to us and how much would it cost us as a society? So, take a wild guess how fast it would exceed the gross domestic product of the United States if every email needed a stamp that's being sent in the United States?

Hall T Martin: [01:03:24] A month?

Christian Kameir: [01:03:25] It would take a day and a half.

Hall T Martin: [01:03:27] Oh wow!

Christian Kameir: [01:03:28] So, but in a way, we now have the technology to actually do away with all the fees for transferring money as a starting point, and then transferring value in general for free. And we need to catch up to what the technology can be doing and what we're actually doing in our day-to-day terms. I mean banking is an enormous industry and I'm not saying that banking should always go away, I'm just saying that it should embrace technology much, much faster than it has, right? So that is the largest problem. It has been a huge drain on the economy if you think about it because, for the most part, these are non-productive activities if you think about it because they are part of the transaction, but they're not necessarily adding the amount of value to the transaction than they're expecting, to put it mildly.

Hall T Martin: [01:04:26] So, what are the most common misconceptions you have observed on the topic of money in general and CBDCs in particular?

Christian Kameir: [01:04:33] Yeah, so I touched on that several times because it's such a big pet peeve of mine. So, the biggest misconception is that everybody - not everybody, but a lot of people and you will find this if you read some of the CBDC design papers - will cite the functions of money as a unit of account, store of value, and a medium of exchange, and this dates back to 1875, and that was created in a textbook by a British economist called Jevons, and during the time, or actually the year after Jevons published that, Alexander Graham Bell got the patent for the first phone and that's why - let me see if I can bring this up real quick. If you look at the first phone - I need to find a way to get faster through these slides somehow but once I get there you will be impressed, trust me. This is Jevons' definition - I don't know if you can see my screen, let me know - this is a phone that was created by Alexander Graham Bell the year after Jevons published that. I don't know if your phone still looks like that, mine doesn't.

Hall T Martin: [01:06:02] Mine doesn't either.

Christian Kameir: [01:06:02] So, the point here being is so Jevons is describing the technology of his time, he is describing basically the facilities of commodity money. So this is like describing the phone today in terms of how a phone looked like in 1876, and that is kind of my biggest pet peeve, it's the biggest misunderstanding around money in general. So, money today has nothing to do with money of 1875. It's not commodity money and commodity money was actually never a relevant medium of exchange even in Jevons' time, right? And so, that's probably the most common misconception. The other misconception and the common mistake we're seeing is the conflation of functions. So, that has to do with the particular definition of _____ and it also has to do with any other cryptocurrency and any other stable coin that wants to introduce a new unit of account. It's not going to happen. You won't be seeing a

Bitcoin price on a banana, you won't be seeing a _____ price, you won't be seeing a _____ price on a banana. I will take any number of bets against this happening any time in the future within the next 10 years, it's simply not going to happen. So, those are the two main misconceptions. Then another misconception that we haven't touched on but I think is very relevant and should be understood much better is the concept of inflation. There's oftentimes and I made this mistake myself I have to admit some time ago where I would show a slide that would show the decline of the U.S. Dollar in terms of its comparison to the value of dollar, right? So, in terms of the value of gold specifically. So, the typical inflection point that's being used is the "Nixon shock" when Nixon finally took us "off the gold standard" in August 1971. And so, as I mentioned, I've shown the slide myself and I will show you that for the past 30 years, the Dollar has lost 97% of its value because of the amount of gold you could buy at the time when it was still on the gold standard, which is no longer the case today. What this ignores entirely, is A, even back then, most money was actually still held in accounts. So, today it's 97% of money is held in accounts, even back then, it was 92% of all money was commercial bank money. So, this is referring to the common misconception that the main money creation is done by Federal Reserve banking; the main money creation is being done by commercial banking. And so, this is inflationary if and when it's being done for unproductive means, i.e. if you create yet another new mortgage for a house that already exists. So, that has been the biggest point of inflation. And so, by some math, and it's mostly driven by researchers out of the United Kingdom, this has inflated the asset primarily, on average, by more than 10% year over year, but then also obviously has added to overall money supply in that same amount year over year. And so, other creation of money has been done specifically to inflate things like education. So specifically student loans, because it's very attractive for banks to create this form of money since the loan holder cannot default on the debt. So, the larger point here being is a common misconception is that inflation has been caused by the Federal Reserve banks creating money. No, inflation is caused if you create new money from non-productive means and it's primarily cause on and for those assets. And the secondary part is then on the overall money supply and your usage of money as a form of payment, which if you understand this, then I think the overall mandate for CBDCs in general - and I think we touched on that earlier - is to allow people to step away from that inflation, both on an international level, but then also on a national level. Think about it in terms of any money that's sitting in your account right now is being used for lending purposes, right? So, it's being typically lent out by your bank. Either it's been lent to you, or it's being lent to us and where this financial institution gets to make interest on that. So, that same option right now, because you can't custody digital assets is not available to you. So, if and when it's available to you at the most efficient rate, i.e. means if you could swap out of today out of your certificate of deposit into your checking account, right, instantly, there wouldn't be a need for you to keep money in your checking account and your _____ account at any given point in time if and until you want to use it for payment. So, my expectation is that either CBDC and/or cryptocurrencies, and probably more likely both will enable this facility. So what this will do as an extension, it will go a long way to mitigate inflation because it would allow people to sidestep this inflationary behavior of currencies in general, and ideally, it would enable this on an international level. But again, that is obviously at this point in time mostly speculation, but I would love to see this implemented in design choices. Does that make sense?

Hall T Martin: [01:12:05] Yes. So, will privately-issued money compete with CBDCs?

Christian Kameir: [01:12:12] It could. It could if it's better money. You probably have heard of the term Gresham's Law, which is a little bit funny that it's Gresham's Law because it's the simple fact that bad money drives good money out of circulation, that's the long version of that, and this is actually already mentioned, I think, by Aristotle before Christ but eventually got attributed to Gresham much, much later. So, the point here being is that most money right now, as we established 97% and probably much more, is actually a representation of something else, right? So that's a mortgage, it's a representation of something that's _____ the house or it's secured by the house. So, the larger point here is that good money is ideally secured and it's secured by something that I can ideally, immediately liquidate. We see this right now in the decentralized finance markets to where there is very, very little risk to pledge _____ assets. The reason being is because it's pledged in a way that's locked into a smart contract, and if it's being lent out, it's actually secured in a way that if you lend it out and the borrower doesn't follow its obligations, it's simply being returned to you immediately through a smart contract as an automatic function. So, if you have private currencies that are backed in a very similar fashion, but eventually by a physical instrument and we see the nascent implementation of those things, I think about securities that are based on the securitization of physical assets such as houses. So you can imagine that if that lending system is large enough and it's about to issue its own cryptographic currencies that is U.S. dollar-denominated, but it's secured by a house rather than by the promise of a government, that might be very attractive to a large portion of the population, not only in this country, but also obviously in other countries around the world. So, in this particular case, and A, if it's branded with something that's known like the U.S. Dollar and then B, if it's branded by a known entity like a large commercial company that is already trusted for what it's been doing and this could be a bank or that could be a mortgage service provider, then this might have much greater attractiveness than a CBDC.

Hall T Martin: [01:14:58] So, what is your thesis on the impact of CBDC on the foreign exchange markets?

Christian Kameir: [01:15:04] So there's some expectation that essentially forex will be extended to users in general to the general population, because right now you've probably noticed there's very little _____ in the foreign exchange markets. It will take tens of millions of dollars to make any significant amounts moving this money around, so they're only about ten large banks that are really involved at scale and doing forex specifically. But if and when this becomes available to the average user, so if there was interchangeability between CBDCs of different countries, so then you can envision that you have a smart wallet where you can set a function to say, well, if my local currency is more inflationary than another international currency that is swappable at any given point in time, well, then I can check a box and decide, OK, instead of holding my local currency, let's say it's the Bolívar, or let's say it's the Naira or something like that, at any given point in time, just hold it in my wallet as a U.S. Dollar or hold it as a U.S. Dollar. So, if and when this happens, and it's not likely going to happen soon, but it will eventually happen and my _____ expectations is it might happen by accident, might happen by

someone creating an instrument that just happens to be _____ to the U.S. Dollar that's issued and guaranteed by a government and it starts to spread in some beachhead like a small nation island or island nation, and will then find enthusiasts around the world that realize, oh, this is always being backed by the U.S. Dollar in essence, but it's just there's this other funny symbol, but if I want to spend a Dollar, I can just swap it - which is the facility - then this will all of a sudden become very attractive to potentially a big group of users. I mean, the most imminent threat that, as you probably know has been identified by Congress are things that are social networks in there particularly Facebook and their offshoot of Libra or whatever they're calling their digital currency right now, because, again, it comes down to what I said in the beginning, money lives off the network effect. _____ money itself doesn't have any value that's why it's so misguided to think of this as a store of value, that the main value in "money" is in the technology and there specifically its network function, right? So, how many people are accepting it for payment? How many people are accepting it today and how many people do I expect will still accept this tomorrow? So, if you then combine this with a large user group like 10 million daily active users on the social network, that then all of a sudden can trade with each other, that is very potentially dangerous to a nation's currency. And obviously, Congress has identified that and has put forth some serious questions and so has half the European regulators in that sense.

Hall T Martin: [01:18:35] So, which countries are furthest ahead in the development of CBDCs?

Christian Kameir: [01:18:40] Yes, so ostensibly it's China. But there again, I would put China in its own bucket simply because they might have different design goals, because also in China, you already had payment instruments that were instant and didn't involve cash _____. And so, they have different interests, albeit it will go a long way to facilitate efficiencies and trade _____ in that country, quite obviously. So, they are in that sense, the furthest ahead. Canada has started their development early. I think they are mentally ready, albeit are not technically ready. We have observed a couple of technologies that have been initially tested, they are provided by the larger enterprise organizations, and I think, for the most part, have been tested and put on ice for the time being and as far as like using open-source technologies, we are hopeful that MIT who has pledged to work with the Federal Reserve of Boston to put out an open-source project on the topic of CBDCs will hopefully make this available sometime next year, which would go a long way for international development, right?

Hall T Martin: [01:20:11] So what are other technology developments that would influence the design of CBDCs?

Christian Kameir: [01:20:16] Yeah, so the largest point is "identity" here, and I always use that term with quotation marks because there's a whole field of identity technology that actually belongs in the realm of transhumanism, so it's the idea of transferring consciousness to the digital realm. So a lot of people in that space that work on identity solutions, what they're really working on is legal technologies and they're specifically the topic that legalists refer to as agency, but it's the counterpart that you need for anything like a digital-bearer instrument or a CBDC that functions as a peer-to-peer exchange instrument will need. The point there being is,

current account-based systems almost always require know your customer regulations and email regulations. So, there you have to provide your government credentials, and if and when those conditions are satisfied the bank or financial institutions would allow you to create an account. So, if this was still true in the future and if that was still true for CBDCs, then this would exceed a lot of design goals that a lot of objectives that they set for specifically onboarding a lot of people that are unbanked today. So, there are a lot of movements underway that fly under the banner of what's called self-serving identity, and it's a stack that you control, so you as an individual can have access to and then can provide an attraction that I mentioned earlier where your credentials become also digital bearer instruments. So, that is the most important counterpart, in my opinion, that is missing from the development and that's not being given enough consideration in those CBDC design papers, because unless we have these functions, it seems very unlikely that a lot of government agencies would go along and allow people to create digital wallets that don't require KYC unless there might be a scenario where they were limited to certain amounts where you don't have to provide that. But then again, it would defeat a lot of the ideas around the programmability of those instruments, because how do I do KYC on funds that I assigned to a self-driving car, right? That's simply impossible. So, the point here being is you have to, at any given point in time, have to have a relationship between _____ or a right to an individual, but if that is still tied to legacy technologies that are then tied to enforcement to private entities like banks and so forth, that will hamstring the development of anything that is a digital bearer instrument, including a CBDC tremendously. So, identity solutions are the most important thing.

Hall T Martin: [01:23:28] Do you think CBDCs will replace physical cash in the next decade?

Christian Kameir: [01:23:35] Not in the next decades. Very, very unlikely. I mean, cash is very, very convenient and even though some of the design goals in CBDC papers state that these should be transferrable without access to the World Wide Web and without access to technology, I haven't seen any practical approaches that will make this actually possible and I have no idea how this should be facilitated. And so you can think about situations where you are in remote locations, right? You're on vacation on a lake and you need to pay someone to rent a boat and you don't have access to a tower or something, you can't access your funds on your phone because you don't have a connection. So, how do you transfer it _____? There are some limited options there at the moment, but I think for the next 10 years, we will still see about the same amount of cash usage, maybe even a little more.

Hall T Martin: [01:24:44] Ok. Well, what are the three most important lessons you've learned when analyzing and discussing CBDC proposals?

Christian Kameir: [01:24:51] I mean, by now, you have mentioned my pet peeve many times, so I want to stay away or I'll try to stay away a little bit from that. But CBDCs are part of a paradigm shift in financial services. So, the one thing that we've observed that it doesn't help if you've been indoctrinated into the legacy financial systems, right? A lot of times, we'll get pitched as investors on technology and the solution with a team that then references back to some financial services experience, like I had 10 years of banking with XYZ bank. So in my point

of view, more often than not, that's a drawback. And what I mean by that is if you think about it this way, your horse jockey might not make the best fighter pilots for your plane right, and it's a true handicap it seems in thinking. The other handicap there is that of specifically legal professionals in that space, and I think that has potentially done the most damage to this space. What I mean by that is legal professionals tend to be overly cautious and explain the law in a way that doesn't allow technology solutions providers to cater to the needs of the law, but mostly to the needs of the lawyer. What I mean by that is a lot of solutions that are being built right now that are blockchain-based or decentralized-software-based actually can more efficiently fulfill the purpose that the law is trying to do, right? So, if you think about do I see solutions in preventing money laundering solutions, digital ledgers and decentralized ledgers, are an ideal instrument, that's why it's such a common misconception that, for example, Bitcoin transactions are anonymous, they have never been anonymous, _____ and for the most part are easily trackable and are a terrible instrument to do money laundering, but it's much easier and that's the preferred method still to do money laundering that's cash, that's why it's often very disingenuous to say, well, we need to outlaw these crooked currencies but at the same point in time, we're exporting \$60 some billion with \$100 notes internationally, knowing quite well what they're being used for internationally. So, that's one of two main misconceptions. Then the other misconception is that CBDCs aren't as I mentioned, don't spend much time considering identity solutions. I think there needs to be tight cooperation, cooperation with the teams that are developing SSISs, self-solving identity solutions in order for these things to be long-term viable because anything that doesn't cooperate with these solutions, I don't think will long term be interested in technology. And then lastly, and that's my largest pet peeve, the remaining function of money is that of language, and money is best understood by its use cases, which is simply spend _____.

Hall T Martin: [01:28:21] Well, can CBDCs change the position of the U.S. Dollar as the world's reserve currency?

Christian Kameir: [01:28:27] A lot would have to go on. Right now, the Dollar is money of last resort for any other country, to the extent that I believe either 12 or 14 countries eventually gave up on trying to make their own currencies and just come in and _____ their currency to the U.S. Dollar and that was true for countries like Panama for a very long time. So the only reason why this would happen is if there was another currency that was U.S. Dollar-denominated and would have all the facilities of being a digital bearer instrument, so it would be anonymous, it would be, let's call it, swappable against other payment instruments, including a U.S. CBDC. In this case, you could see how all of a sudden there would be a lot more demand internationally, but I think that is very, very unlikely because it comes down to the fact that as a language of value, the U.S. Dollar dominates the international landscape.

Hall T Martin: [01:29:37] Great. Well, in the last few minutes that we have here today, what else should we cover that we haven't?

Christian Kameir: [01:29:44] What else should we cover that we haven't? Wow! We've covered quite a bit. Well, I think the largest call to action this year would be is, understand money as a

technology and I think technology will always move faster than any political discussions, right, as we know, so pay more attention to what is being developed as a technology rather than engaging in some form of political discussion that's mostly useless. I mean, the technology will eventually force the political discussion to change when certain technologies become reality, then government will simply have to react to this. This is why we spent some time talking to government and federal agencies and whatnot and continue to do so, but we'll still spend most of our time with technologies and helping develop this. And then lastly, I think mostly still misunderstood where blockchain-based solutions are today and what blockchain-based solutions are what I like to refer to actually as decentralized software solutions, so I think there's almost no company on the planet that shouldn't look into blockchain-based solutions for their own technology, specifically if you have any databases right now. So, if that's of interest, as I said, I'd like to share our view on this and we don't have any other agenda there than to share our views for peer reviews specifically and promote the state of blockchain-based solutions, and the development_____.

Hall T Martin: [01:31:31] So, how best for listeners to get back in touch with you?

Christian Kameir: [01:31:35] Yeah, I'm mostly "active" on LinkedIn, so you can find me there, although I've maxed out my Connections, so if you want to connect to me I have to delete one of my old Connections. I'm trying to get better to frequently publish things on Forbes, I've been lagging on this lately because I've been sucked into so many discussions around the CBDC topic which is obviously important. So, we're preparing some classes right now for academia on the scale of this effort so that it's not just us promoting, not promoting, but explaining. So, I _____ I infrequently tweet, but the other _____. Obviously also have a website, it's just sustany.com.

Hall T Martin: [01:32:28] Well, great. Well, we'll put those in the show notes. I want to thank you for joining us today and hope to have you back for a follow-up soon.

Christian Kameir: [01:32:34] Any time Hall. Thanks for having me.